

**The Relationship of Breakfast Consumption,
Academic Performance, and Quality Breakfast Type**

A Review of the Literature

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Abstract

This article is about the relationship of breakfast consumption, academic performance and quality breakfast type. It is a collection of relevant literature studies on the relationship of breakfast consumption, students' school performance, and types of breakfast consumed situation. Studies indicated that a healthy lifestyle is important on their academic achievement (Adolphus, 2013). O'Neil (2014) found eating breakfast can increase the cognitive capabilities in the learning process, contrarily, skipping breakfast will not only affect school performance, but also has impact on their psychological and physical development. Studies also pointed that important participation from the parents and caregivers in order to help children develop a healthy habits of breakfast eating (Pearson, 2009). Additionally, quality breakfast is recommended for educating parents. The purpose of this study is to reveal the important value of quality breakfast and to suggest parents and adolescents to pay more attention to breakfast consumption and healthy lifestyle.

Introduction

Breakfast was defined as any eating occasion between 05.00 and 08.59 hours (Ute Alexy et al., 2010). It has been identified as the most important meal of the day, some referred to as break the fast from a long night sleep with empty stomach. What to eat for breakfast is various depending on different cultures or eating habits. General agreement worldwide believes that breakfast is essential for providing nutrition for developmental growth physically and psychologically, breakfast is significant source of nutrition during puberty and has great impact on psychological and cognitive capabilities; at the same time, quality breakfast shall be one of the key topics to support parents for their parenthood as to improve their quality of life, health and academic performance.

The World Health Organization acknowledges that young people who have cultivated a habits of breakfast eating are more likely to have maturity and decrease of chronic diseases. Children who skipped breakfast have higher chance to behavioral and psychological difficulties, especially for school (Adole, 2015). The percentage of schoolchildren who skipping breakfast falls into the range in between 1.7- 30%. Details of the prevalence is shown as follows: 39% of 13-year-old skipped breakfast every school day and 45% for 15-year-old, 2.5% of students skipped breakfast on all school days, and 14% skipped breakfast at least one school day (Gibney, 2018; Mullan, 2010; Boschloo, 2012). In another research by Ute Alexy et al.(2010) in regards to skipping breakfast, showed that a significant negative age trend was found only in 6-12-years-olds. Besides, the distribution of meal types at breakfast changed greatly with age.

From the above figures in the research, we found the seriousness of children skipping breakfast worldwide. This study is to identify the correlation between breakfast and academic performance, in particular to study the effect on cognitive functioning during the learning process when children skipping breakfast and to also promote quality breakfast in terms of children development.

Method and Analysis

Studies have shown the importance of breakfast, it not only affect the nutritional status of children but also their cognitive development. Some researchers also focused on the mediating role of achievement and moderating role of socioeconomic status (SES) regarding breakfast consumption and academic achievement. The results indicated that (1) breakfast consumption had a positive effect on academic achievement; (2) achievement motivation played a partial mediating role in the relationship between breakfast consumption and academic achievement; and (3) the direct and indirect effects were moderated by the SES of students, which meant that

the effect of breakfast consumption on achievement motivation can differ depending on the SES of students (Gao CL, Zhao N, and Shu P, 2021).

In order to increase the prevalence of eating breakfast, the social habits of breakfast consumption can be an important event for family of the day and it can affect young children on eating breakfast. Studies found in the United States that 81.4% of breakfast eaters prepared their own breakfast while the children in Ecuador participated in purchasing food for breakfast preparation in particular for those who belonging to a single-parent family or the parents who left home early in the morning before the breakfast time (Michelson, 1999; Paxson and Schady, 2007). Some studies in Scotland indicated that breakfast consumption happened less when the children eating alone without their parents' participation (Levin, Kirby, and Currie, 2012). Several studies also showed the importance of having breakfast not only for nutrition consumption but also for the benefit of building positive family relationships, in order to help children, develop psychological health (Christensen, 2004; Sen, 2010).

In order to measure the relationship between breakfast consumption and academic performance, research conducted on the relationship between breakfast consumption and cognitive development in students, the majority of studies used student scores to scale the level of cognitive development. It collected data from the academic quality monitoring data of basic education students in Jiangsu province of China in 2018. Two stage stratified sampling method is used to collect data regarding student studies. The research was studied by collecting data which consisted of 56,238 students from third grade of elementary school and 91,543 eighth grade middle school students. Data showed that in a developed region with high social economy, Jiangsu Province still has a high proportion of students who do not eat breakfast. It is found that only a few students skip breakfast because of poverty. Additional research found to sustain the previous research that skipping breakfast is harmful to both psychological and

cognitive capabilities (Yao, Liu, and Zhou, 2019). Further investigations conducted to 225,697 students registered in 241 elementary schools in Ethiopia's South Region, 359 km from Addis Ababa. Breakfast skipping data was collected by using a two-item questionnaire that had been used in a prior study and the responses range from "never have breakfast" to "always have breakfast" with the final score was divided into two categories: rarely having breakfast (never and 1-3 times per week) and frequently having breakfast (4-7 times per week). Result showed that 4.1% of study participations never ate breakfast during the week, while 7.8% had one day per week, 12.8% had two days, 13.4% had three days, and 61.9% had four to seven days per week. Regarding children's behaviors from skipping breakfast, it is found a correlation: two-fifth of them a risk for emotional behavior problems, one fourth of them were a risk for social behavior problems, more than one third of them were a risk for academic behavior problems and around one-sixth of them was a risk for all behavioral problems (Abebe et al. 2022). Breakfast skipping was also found related to parents' educational level, living in rural areas, living with one parent only, living with grandparents, and poor academic accomplishment. Children living with illiterate parents or guardians were more than six times likely to skip breakfast than children living with well-educated parents or guardians.

Although breakfast is very important, skipping breakfast seems like to be a common phenomenon for both children and adolescents. According to the research by Ute Alexy et al. (2010), a total of 7800 3d dietary records from 1081 participants aged 2-18 years, collected between 1986 and 2007, The research was based on DONALD (Dortmund Nutritional and Anthropometric Longitudinally Designed) study and it was a longitudinal and using mixed linear model study. The aim of the research is to reveal the actual data on trends in breakfast habits and composition. Since 1989, the sampling infants have been recruited in regards to the research which was lasting until their age of 18.

The breakfast trend findings revealed a few parts. The results of different age groups in regards to skipping breakfast showed that a significant negative age trend was found only in 6-12-years-olds. Besides, the distribution of meal types at breakfast changed greatly with age. In general, of all breakfast meals, 62% were bread meals and 21% were ready-to-eat cereal (RTEC) meals. Surprisingly, RTEC meals which was found in the study nearly doubled from the youngest to the oldest age group. According to the guidelines, the biggest difference between bread meals and RTEC meals was the consumption of dairy; and only 74% of bread meals but 99% of RTEC contained dairy. The result also demonstrated the figures about total food intake and the intake of food groups at breakfast increased significantly with age, except of fruit/vegetable intake. Gender differences appeared with boys having a higher total intake and higher intakes of all food groups excepting fruit/vegetables, meat and beverages.

Discussions

The research has designed that student scores as the dependent variable and established 4 OLS regression models to verify the relationship between breakfast and cognitive development. As the increase of breakfast consumption during the week, student's academic performance also increased significantly. Regression coefficient analysis indicated that every increase in the frequency of eating breakfast within a week, students' scores by 12-17 points improvement. Students who skipped breakfast during the week had significant lower academic performance from 32 to 38 points than those who ate breakfast. Research found that as the frequency of breakfast consuming increased, the academic performance also increased. Studies showed that elementary students skipping breakfast score 31.222 points lower than those eat breakfast, while middle school students score 31.334 lower (Yao, Liu, and Zhou, 2019). This result indicates that eating or skipping breakfast has positive and negative effects on cognitive development of students. However, approximately 10.4% of elementary students skip breakfast

for at least one day per week, whilst 28.9% skipping breakfast among middle school students though we know the importance of breakfast consumption. Furthermore, the reason why schoolchildren are skipping breakfast are varied depending on their family habits and routines. Some studies indicated that children skipping breakfast because staying up late at night, with variety of interest such as school and extracurricular activities, watching TV and playing games. Children go to bed late and wake up late causing them no time to consume breakfast in the morning (Bagwell, 2000).

The relationship of breakfast consumption and academic performance has demonstrated positive impact to each other. Yet, breakfast consumption could be varied in types, as bread meal or RTEC meals. Skipping breakfast obviously is not supported and at the same time, it is important to maintain high quality breakfast food intake rather than only eating food in breakfast time (Ute Alexy et al., 2010).

Another result of negative age trend in 6-12-years-olds in skipping breakfast could be further studied. At ages 6-12 years, students shall have a better food intake to support their health development and the need of academic improvements. Apparently, time management could be an obstacle for parents of children at 6-12 years to be able for a quality and long breakfast every day. Nowadays, parents at different age groups may prefer purchasing bread every day for children in fast-food bakery; that is the reason why the major 62% in total breakfast food type comes from bread meals. In comparison, bread meals are more convenient and economic. Food-based dietary guidelines suggested that a high-quality breakfast shall contain three components including a grain product, fruit/vegetables and a dairy component or an alternative source of calcium. Therefore, knowing that the breakfast consumption has positive impact in high academic performance is essential but at the same time, quality food types and gender differences in regards to physical development shall not be neglected.

In Germany, the traditional bread meals in breakfast are still predominant today in spite of the competition by RTEC, in which bread or bakery item, spread and filling, in combination with a warm beverage (Mattys C. et al. 2007). In France, RTEC consumption declined with age (Preziosi P. et al.1999). In the US. RTEC at breakfast was closely associated with greater daily intake of milk and calcium (Song Wo et al. 2006). China is a country with large population and various subcultures, people consume different breakfast to begin the day. Since China was built by agriculture, the majority of the breakfast are cooked related to grain and carbohydrate which is rice noodle, Zongzi (sticky rice wrap), or buns, while RTEC consumption is vary depending on how young the generation of the areas. All these cultural differences shall response to the quality of breakfast as one of the main objectives to support its positive impact between breakfast consumption and academic performance.

Conclusion

Research studies reveal the importance of breakfast consumption, it affects the physical and cognitive development. Breakfast consumption was found having a high correlation to academic performance and further impact on their behavioral performance in school. Nowadays, breakfast has been affordable for most of the families, skipping breakfast is not a matter of family economy but neglection of the importance of breakfast or busy lifestyle of the family. Breakfast is not only serving the purpose of filling the empty stomach, a quality breakfast can also become a source of good academic and behavioral performance for schoolchildren. Additional studies could be done to suggest that not all breakfasts can serve the purpose of supporting schoolchildren's performance but only the high-quality breakfast can provide sufficient nutrition to sustain the physical and cognitive development. Through this study we learn the importance of preparing nutritional breakfast to the children, it's suggested that the families should pay attention to their breakfast eating habit otherwise the school can

implement breakfast nutrition plan to ensure schoolchildren can consume sufficient nutrition when the families are not available to provide.

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